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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/068,004

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Woo Young So

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7590

12/04/2002

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EXAMINER

SEFER, AHMED N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/068,004

Applicant(s)

SO ET AL.

Examiner

A. Sefer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-16 and 22-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-25 is/are allowed.
- 6) ☒ Claim(s) 12-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 12-16 and 22-25 in Paper No. 7 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki et al. US Patent No. 6,017,783.

Yamazaki et al disclose in fig. 1 a in thin film transistor (TFT), comprising: a substrate 1; a semiconductor layer formed over said substrate having end portions; a first insulating layer 6 disposed on said semiconductor layer so as to expose ones of the end portions of said semiconductor layer; a gate electrode 8 formed over said first insulating layer; a capping layer 11 formed over said gate electrode; spacers 10 formed over said first insulating layer and on both sidewall portions of said gate electrode and said capping layer; high-density source and drain regions 3 formed at the ones of the end portions of said semiconductor layer exposed beyond said spacers; source and drain electrodes 7 which directly contact, respectively, said high density source and drain regions.

Regarding claims 14, Liang et al disclose said first insulating layer, said capping layer and said spacer are of an oxide.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 12, 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (JP 11-261076) in view of Uchida et al (JP 5-121435).

Yamazaki et al disclose in figs. 1 and 13 a in thin film transistor (TFT),
comprising: a substrate 100/1000; a semiconductor layer 106/1130 formed over said substrate having end portions; a first insulating layer 19/1200 disposed on said semiconductor layer so as to expose ones of the end portions of said semiconductor layer; a gate electrode formed over said first insulating layer; a capping layer 121/2110 formed over said gate electrode; spacers formed over said first insulating layer and on both sidewall portions of said gate electrode and said capping layer; high-density source and drain regions 104, 105 formed at the ones of the end portions of said semiconductor layer exposed beyond said spacers, but do not specifically disclose source and drain electrodes directly in contact, respectively, said high density source and drain regions.

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Uchida et al disclose in fig. 3 source and drain electrodes 11, 12 directly in contact, respectively, with high density source and drain regions 9.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teachings of Uchida et al with the device of Yamazaki et al, since that would provide a device capable of preventing charge-up as taught by Uchida et al.

Regarding claim 13, Yamazaki et al disclose low-density source and drain regions 107, 108 having a same conductivity as said high-density source and drain regions formed at regions of said semiconductor layer under said spacers, wherein said semiconductor layer has lightly doped drain (LDD) regions under said spacers.

Regarding claim 15 and 16, Yamazaki et al disclose a silicide layer 105a or a refractory metal (as in claim 16) formed between said source electrode and said high-density source region and between said drain electrode and said high-density-drain region.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. US Patent No. 6,017,783 in view of Liang et al. US Patent No. 6,071,783.

Yamazaki et al. disclose the claimed structure except for the lightly doped drain (LDD) regions under spacers.

Liang et al. disclose in fig. 8 low-density source and drain regions 6b, 6c having a same conductivity as high-density source and drain regions 12 formed at regions of said

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semiconductor layer under spacers 7, wherein said semiconductor layer has lightly doped drain (LDD) regions under said spacers.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teachings of Liang et al with the device of Yamazaki et al, since that would minimize hot carrier effects.

Allowable Subject Matter

7. Claims 22-25 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (703) 605-1227.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on (703) 308-6601.

ANS
November 30, 2002


NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800